Space Weather Highlights **SEC PRF 1605**
29 May – 04 June 2006 **06 June 2006**

Solar activity was at very low levels. On 04 June, new Region 892 (S08, L=284, class/area, Dsi/230 on 04 June) rotated onto the east limb and produced only low level B-class activity.

No greater than 10 MeV proton events were observed this period.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal levels.

The geomagnetic field ranged from quiet to unsettled levels with isolated intervals of active conditions on 01 June. Solar wind speed ranged from a low of about 300 km/s early in the period to a high of near 600 km/s early on 02 June. The period began with wind speeds very low and the Bz component of the IMF weak, not varying much beyond +/- 5 nT. These conditions persisted through midday on 30 May. As a result, the geomagnetic field was quiet. Thereafter, and through early on 02 June, wind speed began a gradual rise to near 600 km/s, while the IMF Bz fluctuated through +/- 10 nT as a recurrent coronal hole wind stream became geoeffective. The geomagnetic field responded with mostly quiet to unsettled conditions at middle latitudes with quiet to active conditions at high latitudes on 30 May. Quiet conditions were observed at all latitudes on 31 May. By midday on 01 June, an isolated minor storm period was observed at high latitudes while middle latitudes remained at quiet to unsettled levels. By midday on 03 June, wind speed began to decrease while the IMF Bz relaxed, not varying much beyond +/- 3 nT. During this period, the geomagnetic field was quiet at all latitudes. The period ended with a wind speed around 380 km/s.

Space Weather Outlook
07 June - 03 July 2006

Solar activity is expected to be at very low to low levels.

No greater than 10 MeV proton events are expected.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels on 08 – 13 June.

The geomagnetic field is expected to be mostly quiet to unsettled for the majority of the forecast period. Recurrent coronal hole high speed wind streams are expected to rotate into geoeffective positions on 07 – 08 June, 14 June, and again on 28 June. Active to minor storm conditions are expected on 07 – 08 June while unsettled to active periods are expected on 14 and 28 June.

Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10^{-6} hemi.)	X-ray Background	Flares: X-ray Flux C	M	X	Optical S	1	2	3	4
29 May	81	54	90	A2.8	0	0	0	0	0	0	0	0
30 May	80	51	130	A3.0	0	0	0	0	0	0	0	0
31 May	78	44	60	A2.1	0	0	0	0	0	0	0	0
01 June	77	11	30	A2.1	0	0	0	0	0	0	0	0
02 June	75	0	0	A2.8	0	0	0	0	0	0	0	0
03 June	76	0	0	A4.4	0	0	0	0	0	0	0	0
04 June	76	17	230	A4.4	0	0	0	0	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm^2-day-sr) >1 MeV	>10 MeV	>100 MeV	Electron Fluence (electrons/cm^2-day-sr) >.6 MeV	>2MeV	>4 MeV
29 May	1.6E+5	1.7E+4	3.7E+3		2.3E+6	
30 May	3.5E+5	1.7E+4	3.8E+3		1.6E+6	
31 May	1.9E+5	1.6E+4	3.6E+3		9.0E+5	
01 June	2.3E+5	1.6E+4	3.6E+3		8.5E+5	
02 June	1.4E+5	1.6E+4	3.5E+3		9.5E+5	
03 June	1.4E+5	1.6E+4	3.6E+3		1.3E+6	
04 June	1.8E+5	1.6E+4	3.4E+3		1.7E+6	

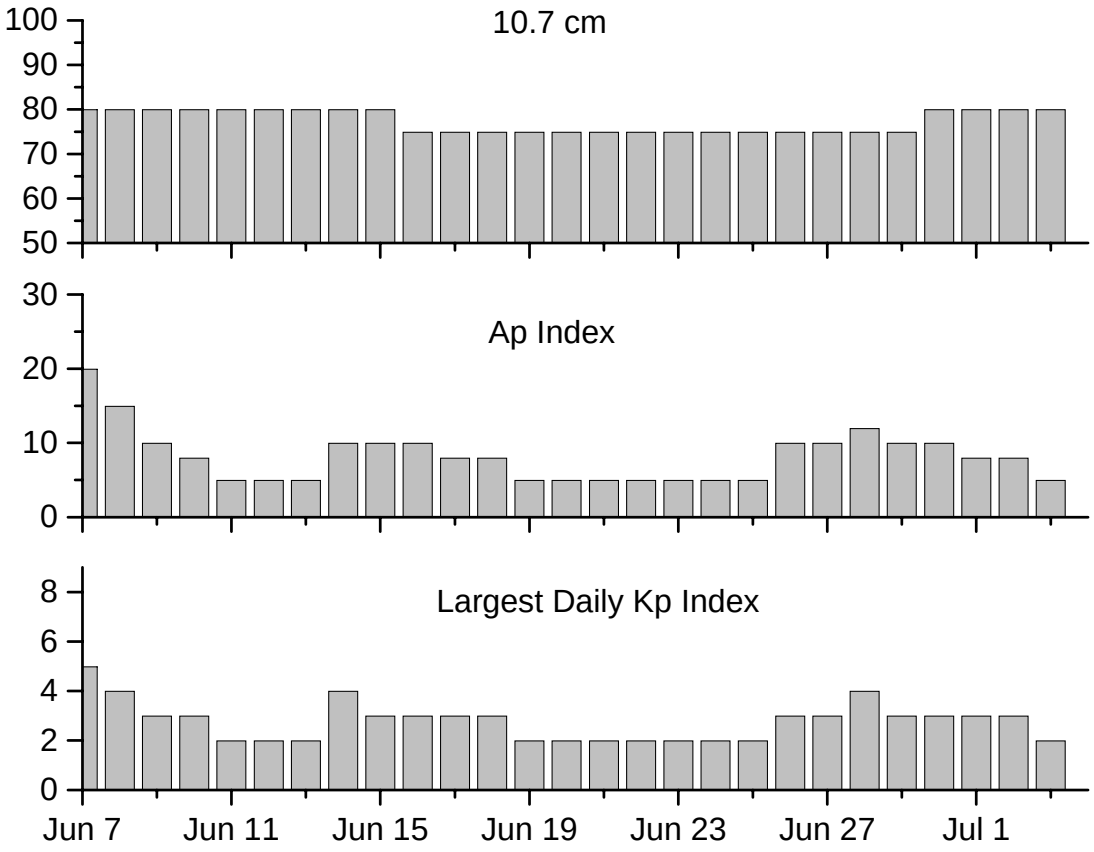
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg A	K-indices	High Latitude College A	K-indices	Estimated Planetary A	K-indices
29 May	1	1-0-0-0-0-1-0-1	1	2-0-0-0-0-0-0-0	3	1-1-0-0-0-1-0-1
30 May	7	1-1-0-2-3-2-3-2	10	1-1-0-4-4-2-2-1	9	2-2-0-2-3-2-3-2
31 May	4	2-1-1-1-2-1-1-1	5	2-2-1-2-1-1-1-1	6	3-2-1-1-1-1-1-2
01 June	10	2-2-2-3-2-2-3-3	15	3-2-3-5-3-2-2-2	13	2-2-2-4-2-2-4-3
02 June	5	2-3-2-1-1-1-1-1	6	3-2-2-2-0-1-1-1	8	3-3-2-1-1-2-2-1
03 June	2	1-1-1-0-1-1-1-1	3	1-1-1-1-1-1-1-1	4	1-1-1-0-1-1-1-1
04 June	1	1-0-0-1-0-0-0-1	1	0-1-1-0-0-0-0-1	2	1-0-0-0-1-1-1-1

Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
30 May 1333	WARNING: Geomagnetic K=4	30 May 1333 - 1500
30 May 1334	ALERT: Geomagnetic K=4	30 May 1334
30 May 1450	ALERT: Geomagnetic K=5	30 May 1447
01 Jun 1143	WARNING: Geomagnetic K=4	01 Jun 1142 – 1500
01 Jun 1144	ALERT: Geomagnetic K=4	01 Jun 1144
01 Jun 1926	WARNING: Geomagnetic K=4	01 Jun 1930 – 02 Jun 1600
02 Jun 0426	ALERT: Geomagnetic K=4	02 Jun 0415
04 Jun 2150	WATCH: Geomagnetic $\geq$20	07 Jun

Twenty-seven Day Outlook



Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index
07 June	80	20	5	22 June	75	5	2
08	80	15	4	23	75	5	2
09	80	10	3	24	75	5	2
10	80	8	3	25	75	5	2
11	80	5	2	26	75	10	3
12	80	5	2	27	75	10	3
13	80	5	2	28	75	12	4
14	80	10	4	29	75	10	3
15	80	10	3	30	80	10	3
16	75	10	3	01 July	80	8	3
17	75	8	3	02	80	8	3
18	75	8	3	03	80	5	2
19	75	5	2				
20	75	5	2				
21	75	5	2				

Energetic Events

Date	Time Begin	Time Max	Time ½ Max	X-ray Class	X-ray Integ Flux	Optical Information Imp/ Brtns	Optical Information Location Lat CMD	Optical Information Rgn #	Peak Radio Flux 245	Peak Radio Flux 2695	Sweep Freq Intensity II	Sweep Freq Intensity IV
No Events Observed												

Flare List

Date	Time Begin	Time Max	Time End	Optical X-ray Class.	Imp / Brtns	Location Lat CMD	Rgn
29 May	No Flares Observed						
30 May	0202	0211	0218	B1.3			887
31 May	No Flares Observed						
01 June	No Flares Observed						
02 June	No Flares Observed						
03 June	0453	0457	0459	B1.9			
	1806	1816	1820	B1.7			
	1841	1849	1900	B2.8			
04 June	0857	0903	0912	B5.6			

Region Summary

Date	Location (° Lat ° CMD)	Location Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	Flares X-ray M	Flares X-ray X	Flares Optical S	Flares Optical 1	Flares Optical 2	Flares Optical 3	Flares Optical 4
	Region 885														
20 May	S12E44	146	0040	04	Cro	002	B								
21 May	S12E32	144	0060	06	Dro	005	B								
22 May	S12E17	146	0060	07	Dso	006	B								
23 May	S12E03	147	0060	06	Dsi	011	B								
24 May	S12W09	145	0060	02	Dso	004	B								
25 May	S11W25	148	0050	09	Dso	008	B								
26 May	S12W38	148	0040	07	Cro	003	B								
27 May	S12W54	151	0020	02	Cro	003	B								
28 May	S12W67	151													
29 May	S12W80	151													
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 147

Region Summary-Continued

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
					Region 886										
23 May	N08E46	104	0030	05	Cro	003	B								
24 May	N07E31	105	0080	07	Dso	007	B								
25 May	N08E16	107	0050	06	Cao	005	B								
26 May	N08E04	106	0060	08	Cso	003	B								
27 May	N08W12	109	0050	07	Cso	006	B								
28 May	N07W24	108	0030	04	Cso	005	B								
29 May	N08W40	110	0020	01	Hsx	001	A								
30 May	N08W53	110	0040	03	Cro	003	B								
31 May	N07W66	110	0020	01	Hrx	001	A								
01 Jun	N09W78	109	0030	01	Axx	001	A								
								0	0	0	0	0	0	0	0
Crossed West Limb.															
Absolute heliographic longitude: 106															
					Region 887										
26 May	S12E64	046	0030	06	Bxo	002	B								
27 May	S13E52	045	0050	06	Cro	004	B								
28 May	S12E38	046	0030	05	Cao	005	B								
29 May	S12E24	046	0030	05	Cao	006	B								
30 May	S12E10	047	0030	01	Hrx	002	A								
31 May	S13W05	049	0010	01	Axx	001	A								
01 Jun	S13W18	049													
02 Jun	S13W31	049													
03 Jun	S13W44	049													
04 Jun	S13W57	049													
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude: 049															

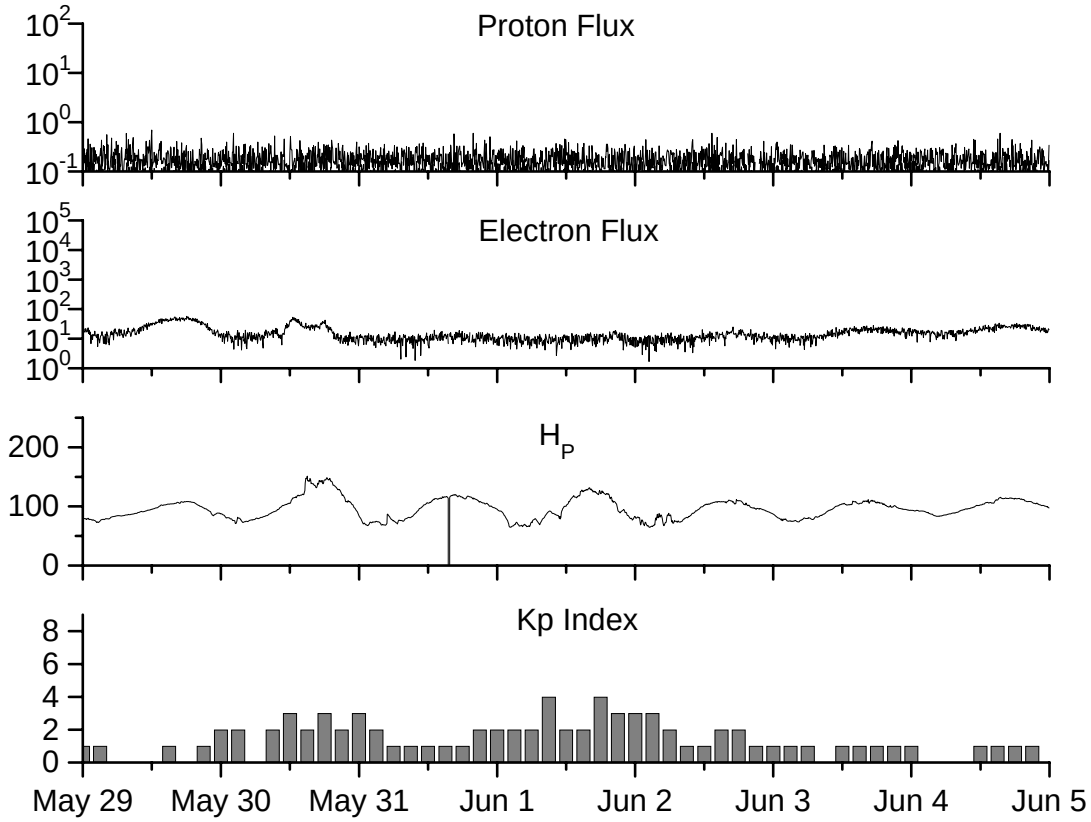
Region Summary-Continued

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
					Region 889										
27 May	S03E12	090	0020	04	Cro	002	B								
28 May	S02W06	090	0040	02	Cso	006	B								
29 May	S01W20	090	0010	01	Hsx	002	A								
30 May	S01W33	090													
31 May	S01W46	090													
01 Jun	S01W59	090													
02 Jun	S01W72	090													
03 Jun	S01W85	090													
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude: 090															
					Region 890										
28 May	S14W29	113	0040	05	Cso	010	B								
29 May	S13W42	112	0030	04	Cso	005	B								
30 May	S15W59	116	0030	02	Cro	002	B								
31 May	S14W73	117	0020	01	Axx	001	A								
01 Jun	S14W86	117													
								0	0	0	0	0	0	0	0
Crossed West Limb.															
Absolute heliographic longitude: 113															
					Region 891										
30 May	S13E19	038	0030	02	Cso	004	B								
31 May	S14E06	038	0010	01	Axx	001	A								
01 Jun	S14W07	038													
02 Jun	S14W20	038													
03 Jun	S14W33	038													
04 Jun	S14W46	038													
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude: 038															
					Region 892										
04 Jun	S08E67	284	0230	10	Dsi	007	B								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude: 284															

Recent Solar Indices (preliminary) of the observed monthly mean values

	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values		Ratio	Smooth values		*Penticton	Smooth	Planetary	Smooth
Month	SEC	RI	RI/SEC	SEC	RI	10.7 cm	Value	Ap	Value
				2004					
April	59.3	39.3	0.66	77.9	45.6	101.2	112.3	11	15.5
May	77.3	41.5	0.54	74.1	43.9	99.8	109.2	8	14.3
June	78.9	43.2	0.55	70.4	41.7	97.4	107.2	8	14.0
July	87.8	51.0	0.58	68.3	40.2	118.5	105.9	23	13.8
August	69.5	40.9	0.59	66.6	39.3	110.1	105.0	11	13.8
September	50.0	27.7	0.55	63.7	37.6	103.1	103.7	10	13.6
October	77.9	48.4	0.62	61.3	35.9	105.7	102.1	9	13.5
November	70.5	43.7	0.62	60.0	35.4	113.2	101.5	26	14.1
December	34.7	17.9	0.52	58.8	35.3	94.6	101.3	11	14.8
				2005					
January	52.0	31.3	0.60	57.3	34.7	102.4	100.3	22	14.7
February	45.4	29.1	0.64	56.4	34.0	97.3	98.5	11	14.6
March	41.0	24.8	0.60	55.8	33.6	90.0	97.2	12	15.3
April	41.5	24.4	0.59	52.6	31.7	85.9	95.5	12	15.7
May	65.4	42.6	0.65	48.3	29.0	99.5	93.2	20	14.8
June	59.8	39.6	0.66	47.9	28.9	93.7	91.9	13	13.9
July	71.0	39.9	0.56	42.9	25.9	96.6	87.8	16	11.8
August	65.6	36.4	0.55	45.4	27.5	90.7	89.3	16	12.2
September	39.2	22.1	0.56			90.8		21	
October	13.0	8.5	0.65			76.7		7	
November	32.2	18.0	0.56			86.3		8	
December	62.6	41.2	0.66			90.8		7	
				2006					
January	28.0	15.4	0.55			83.8		6	
February	5.3	4.7	0.89			76.6		6	
March	21.3	10.8	0.51			75.5		8	

NOTE: All smoothed values after September 2002 and monthly values after March 2003 are preliminary estimates. The lowest smoothed sunspot index number for Cycle 22, RI = 8.0, occurred in May 1996. The highest smoothed sunspot number for Cycle 23, RI= 120.8, occurred April 2000. *After June 1991, the 10.7 cm radio flux data source is Penticton, B.C. Canada. Prior to that, it was Ottawa.



Weekly Geosynchronous Satellite Environment Summary
Week Beginning 29 May 2006

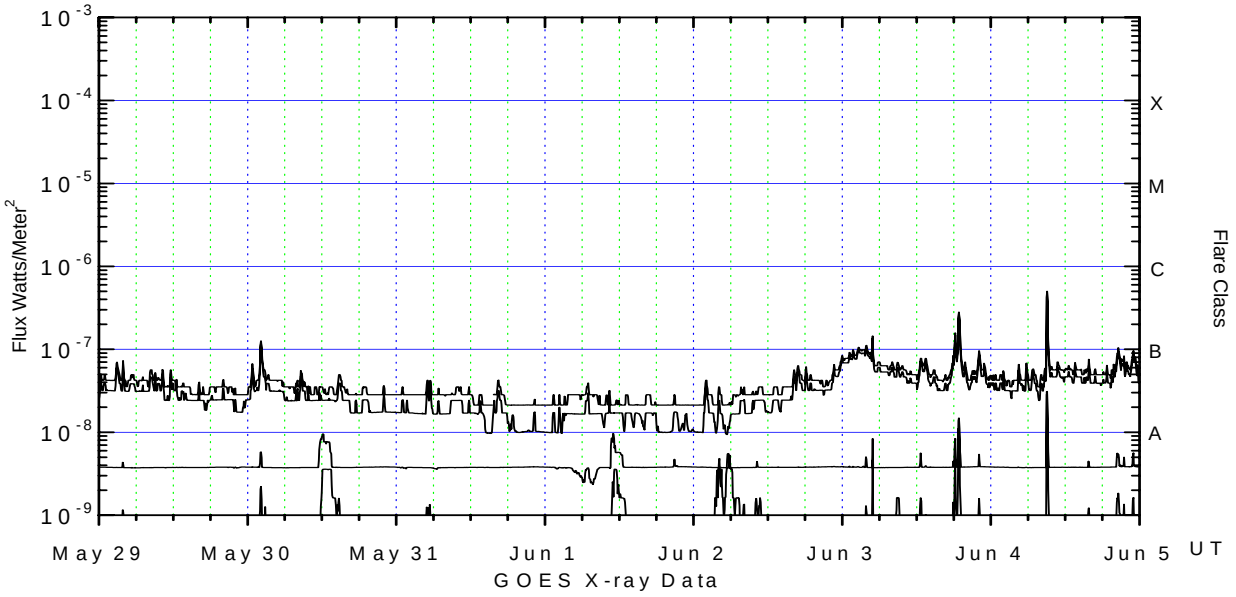
Protons plot contains the five-minute averaged integral proton flux (protons/cm^2 –sec –sr) as measured by GOES-11 (W101) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

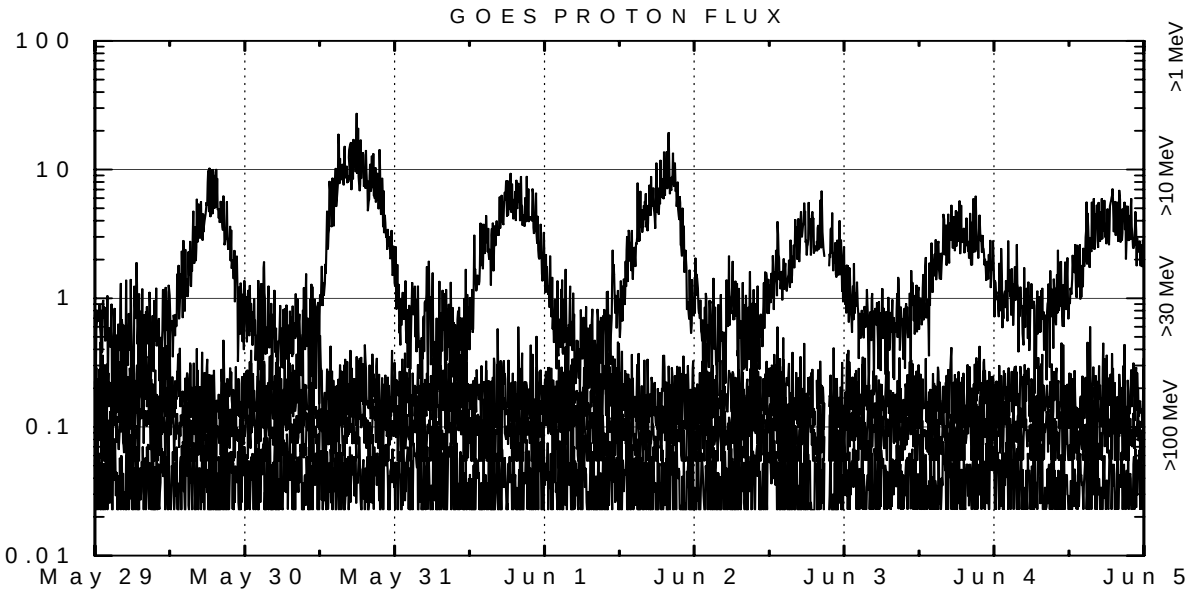
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm^2 –sec –sr) with energies greater than 2 MeV at GOES-12 (W75).

Hp plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-12. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

Kp plot contains the estimated planetary 3-hour K-index (derived by the Air Force Weather Agency) in real time from magnetometers at Meanook, Canada; Sitka, AK; Glenlea, Canada; St. Johns, Canada; Ottawa, Canada; Newport, WA; Fredericksburg, VA; Boulder, CO; Fresno, CA and Hartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC), British Geological Survey (BGS) and the US Geological Survey. These may differ from the final Kp values derived from a more extensive network of magnetometers.

The data included here are those now available in real time at the SEC and are incomplete in that they do not include the full set of parameters and energy ranges known to cause satellite operating anomalies. The proton and electron fluxes and Kp are "global" parameters that are applicable to a first order approximation over large areas. H parallel is subject to more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.





Weekly GOES Satellite X-ray and Proton Plots

X-ray plot contains five-minute averaged x-ray flux (watts/m$^{2)}$ as measured by GOES 12 (W75) and GOES 10 (W136) in two wavelength bands, .05 -. 4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

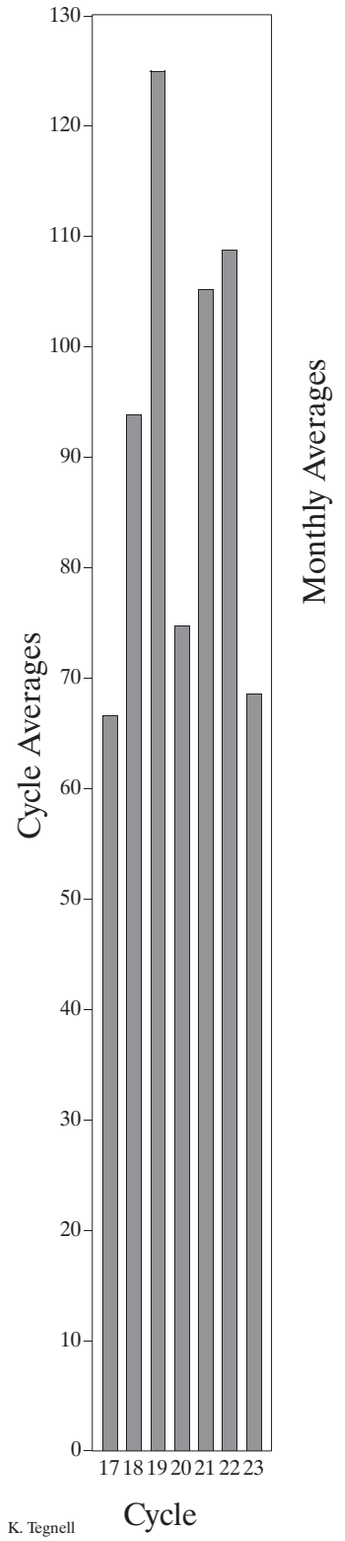
Proton plot contains the five-minute averaged integral proton flux (protons/cm^2 –sec-sr) as measured by GOES-11 (W101) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm^2-sec-sr) at greater than 10 MeV.

Sunspot Number (RI)

March 2006
(Month 114)

Preliminary data

Space Environment Center



K. Tegnell